**Note to Readers:** *EHP* strives to ensure that all journal content is accessible to all readers. However, some figures and Supplemental Material published in *EHP* articles may not conform to 508 standards due to the complexity of the information being presented. If you need assistance accessing journal content, please contact <a href="ehp508@niehs.nih.gov">ehp508@niehs.nih.gov</a>. Our staff will work with you to assess and meet your accessibility needs within 3 working days.

## **Supplemental Material**

# Satellite-Based Spatiotemporal Trends in $PM_{2.5}$ Concentrations: China, 2004–2013

Zongwei Ma, Xuefei Hu, Andrew M. Sayer, Robert Levy, Qiang Zhang, Yingang Xue, Shilu Tong, Jun Bi, Lei Huang, and Yang Liu

#### **Table of Contents**

**Table S1.** The website links of PM<sub>2.5</sub> data sources

#### Validation of Aqua MODIS C6 AOD products

**Figure S1.** AERONET sites included in this study.

**Figure S2.** Validation of Aqua MODIS C6 DB and DT AOD products with different NDVI categories. The solid lines are the regression lines. The dot lines are the 1:1 lines. The dash lines indicate the expected error (EE) envelopes ( $\pm$  (0.05 + 20% of the AERONET AOD)) and the double EE envelopes ( $\pm$  2 × (0.05 + 20% of the AERONET AOD)). Mean bias is defined as the mean value of the differences between AERONET AOD and satellite AOD values.

### Comparison of model performance using GEOS-5 FP and GEOS-5.2.0 meteorological data

- **Figure S3.** Comparison of CV estimations using GEOS-5.2.0 and GEOS-5 FP for the first-stage model (A) and the overall model (B) for Jan-May, 2013 (N=21,678)
- **Table S2.** Summary statistics of daily comparisons between the estimations using GEOS-5.2.0 and GEOS-5 FP data (04/2012-12/2012, 273 days)
- **Table S3.** Descriptive statistics of variables for the modeling dataset of 2013 (N=63,031)

**Table S4.** Fixed effect, model fitting and CV results of the first-stage LME model for each province

**Figure S4.** Annual mean PM<sub>2.5</sub> concentrations of 2013 for first-stage LME model (A), full model (B), and ground measurements (C). The mean ground-measured PM<sub>2.5</sub> concentrations are calculated from the days when corresponding gridded AOD values are available.

**Figure S5.** Sensitivity analysis of how many available AOD-derived PM<sub>2.5</sub> estimations in a month (A) or season (B) can represent a true monthly or seasonal mean value, respectively. Since there are fewer data points at the seasonal level, we use a 5-day moving time window here. For example, the label of "1-5" of X-axis in (B) means it includes available days from 1 to 5.

**Figure S6.** The spatial distributions of 10-year seasonal mean PM<sub>2.5</sub> estimations (2004-2013).

#### References